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EUROPEAN PATENT OFFICE
(International Preliminary
Examining Authority)
Erhardtstr. 27
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Madrid, 10 August 2004

By DHL
PCT - CHAPTER II - INTERNATIONAL PRELIMINARY EXAMINATION
VERY URGENT - PLEASE, DELIVER IMMEDIATELY

Re: International application no. PCT/ES03/00446
Applicant(s): VODAFONE GROUP PLC, *et al.*
O/Ref.: PXWO00312/2003

Dear Sirs:

With reference to the first Written Opinion issued on the above-captioned application (date of mailing: 14 July 2003), we herewith submit the following:

(1) First of all, we thank the Examiner for his/her detailed analysis of the claims.

In order to put the application in condition for a favourable International Preliminary Examination Report, we herewith file:

- (A) CLAIMS AMENDMENTS EXPLANATION SHEET(S) (a)-(e), (expressions crossed out are deleted, underlined expressions are added; within <*** - ***> we have inserted comments regarding certain amendments)
- (B) Replacement sheets 26-29 and supplemental sheet 30, comprising retyped claims including the specified amendments.

(2) Support for the amendments:



Most of the amendments are self-evident. In the claims amendment explanation sheets we have added, between asterisks, information regarding support for some of the amendments.

All amendments made are considered to be directly and unambiguously derivable from the application documents as originally filed. The application as amended is not considered to contain subject-matter that extends beyond the content of the application as filed.

In what regards any subject-matter considered to have been withdrawn from the above-captioned application, either explicitly or implicitly, the applicant herewith reserves himself the right to restore said subject-matter to the application and/or to file (in the respective national phases) a divisional application containing all or part of said subject-matter.

(2.1) Most of the amendments correspond to objections raised by the Examiner in the Written Opinion; we trust that these amendments will overcome said objections, as far as they concern the claims.

(3) Novelty/inventive step:

(3.1) First of all, we do not fully agree with the Examiner's conclusions regarding the originally filed claims. D1 (=US-6310948-B1) relates to a conventional "fixed" telephone network, using "voice announcement" for informing the user. At a first look, there is nothing in D1 that would prompt the skilled person to consider applying teachings of D1 to a mobile telephony network and, especially, not for alerting visiting subscribers in such a network, as the concepts of roaming and visiting subscribers are only applicable to mobile telephony networks. Thus, although it may be true that combining selected features of D1 and D2 (=WO-01/22752-A1) a person would be able to arrive at a combination of features corresponding to the invention as defined in original claims 1 and 13 of the instant application, we believe that the "obviousness" of such a combination may be due to an *ex post facto* analysis of the inventive step.

(3.2) Nevertheless, we have further amended the claims by merging original claims 1&3 and 13&16, respectively, thus introducing into the independent claims the issue of determining the identity of the home mobile telephony network (HPLMN) based on the International Mobile Subscriber Identity of the visiting subscriber.

This feature is important, because it is thanks to the determination of the identity of the HPLMN that important decisions can be taken, for example, whether the visiting subscriber is entitled to a dialling error notification service (cf. claim 13 of the amended set of claims enclosed herewith) and what text to use for the short message (cf. claims 4 and 17 of the amended set of claims enclosed herewith).

(3.3) Thus, should the Examiner not recognise the inventive step of the subject-matter of independent claims 1 and 11 filed herewith, it is respectfully requested that the Examiner carefully consider the inventive step of the subject-matter of claims 4, 13 and 17, as these claims define the technical features providing for a suitable selection of text (for example, language, etc.) and for a selective access to the dialling error notification service, based on the IMSI (and, thus, on the identity of the HPLMN) of the visiting subscriber.

There is no such thing suggested in D1 or D2. Especially, the "Nice (France)" example mentioned by the Examiner seems to relate to "context based analysis" of the dialled number, not of the identity of the dialler and, especially, not of the identity of the dialler's HPLMN (this concept is not even relevant for the kind of fixed networks referred to in D1). Actually, as the concept of roaming is not relevant for fixed networks, in the "Nice (France)" example of D1, there is no "visited network" that has to obtain any identity of any "home network".

Thus, it is especially believed that, at least, the subject-matter of amended claims 4, 13 and 17 must be considered to involve an inventive step over D1 and D2.

(3.4) Further dependent claims define additional features that, when combined with the features defined in the claims from which they depend, seem to involve an inventive step.

(3.4.1) For example, amended claims 2 and 12 define that the first node (that is, the one comprising means for analysing a number dialled by a visiting subscriber and determining whether said dialled number complies with at least one predetermined error criterion) is a Service Control Point (SCP) of the visited mobile telephony network. This is not suggested in any of documents D1 and D2 (contrarily to what is suggested by the Examiner); the choice of the SCP for implementing the means for error detection does not seem to be rendered obvious by D1 and/or D2, neither when taken alone nor when taken in combination.

(3.4.2) Amended claims 3 and 16 define how instructions to send a short message are transferred from the first node to a short message sending server, through intermediate nodes, by a (first) message (M1) and a further http message carrying the respective instructions for sending the short message. We have not observed anything similar in D1 or D2. The claimed approach provides for a practical way of implementing the claimed system using the SCP node of an intelligent network, a server handling the sending of short messages, providing for communication between the SCP node and the server using the internet. It seems that the subject-matter of claims 3 and 16 should be considered to involve an inventive step; at least, the combination of features defined in these claims does not appear to be obvious in view of D1 and D2.

(3.4.3) Amended claims 5, 6, 18 and 19 define further details of the system for forwarding adequate short messages; these details, when combined with the

subject-matter defined in the claims from which claims 5, 6, 18 and 19 depend, do not appear to be obvious in view of D1 and/or D2.

(3.4.4) Amended claims 7, 8, 20 and 21 define features concerning how the first node is triggered and provided with the necessary information for proceeding with the method of the invention; we have not found these features in D1 or D2; we believe that the subject-matter of amended claims 7, 8, 20 and 21 involves an inventive step.

(3.4.5) Amended claims 9 and 22 define an import feature, in that the delay between subsequent short messages prevents the user from receiving a plurality of identical short messages, if he rapidly and consequently dials the erroneous number a plurality of times. Repeated dialling of an erroneous number occurs frequently, for example, as the user sometimes believes that a lack of success in setting up a call is due to an error in the act of dialling and not due to an error in the number actually dialled. In such a case, for example, if the user dials the wrong number three times, sending him three short messages would be useless: the relevant information was transmitted in the first message, so the subsequent messages merely cause irritation and imply an unnecessary use of network resources.

Thus, amended claims 9 and 22 are considered to involve an inventive step, as the subject-matter of said claims serve to prevent the user from receiving such useless repeated messages.

(3.5) Thus, in our opinion, the invention as claimed provides for a practical system and method for alerting a roaming user of dialling errors, without any need for accessing nodes that do not pertain to the visited network. The invention can be considered to constitute an alternative to the CAMEL-based solution (according to which the analysis of the dialling takes place in the HPLMN of the roaming subscriber). The invention provides for an alternative that can be implemented by any operator who wants his PLMN to provide the service without any need for special interoperation with the HPLMNs of the roaming subscribers.

(4) We should very much wish to obtain a favourable International Preliminary Examination Report and we believe that the claims filed herewith should be a suitable basis for such a report. However, should the Examiner not find the claims to be sufficiently clear or sufficiently delimited with respect to the cited prior art, or should the Examiner have doubts regarding support for the amendments in the application documents as originally filed, WE SHOULD VERY MUCH APPRECIATE A FURTHER WRITTEN OPINION, IN ORDER TO BE ABLE TO CONSIDER WHETHER FURTHER AMENDMENTS COULD BE APPROPRIATE.

Of course, should the Examiner consider that an oral discussion could be helpful, we should be pleased to discuss any outstanding issues with the Examiner over the telephone; our telephone number is +34 91 806 5600.

Respectfully submitted,

Angel Dávila Baz

Enc: items A-B as specified above, + acknowledgement of receipt form

CLAIMS

1. A dialling error notification system for visiting subscribers in a visited mobile telephony network (~~VPLMN~~)-(100), a visiting subscriber being a subscriber from a home mobile telephony network (~~HPLMN~~)-(200) different from the visited mobile telephony network (100), characterised in that it comprises:

a first node (11) of the visited mobile telephony network (100) comprising means for analysing a number dialled by a ~~subscriber~~visiting subscriber (201) and determining whether said dialled number complies with at least one predetermined error criterion; and

means for sending a short message (~~SM~~)-with a dialling error notification to the ~~subscriber~~visiting subscriber if said dialled number complies with at least one predetermined error criterion;

means for determining the identity of the home mobile telephony network (200) based on the International Mobile Subscriber Identity of the visiting subscriber<***this feature was defined in originally filed claim 3***>.

2.- A system according to claim 1, characterised in that said first node is a Service Control Point (~~SCP~~)-(11) of the visited mobile telephony network (100).

~~3.- A system according to any of the previous claims, characterised in that it comprises means for determining the identity of the home mobile telephony network (~~HPLMN~~) based on the IMSI of the subscriber.~~

4~~3~~.- A system according to any of the previous claims, characterised in that it comprises:

means for sending a message (M1)~~to send a short message~~ to an SS7-IP gateway (16) from the first node (11) of the visited mobile telephony network (100), said message (M1) being a message with instructions to send the short message<***this amendment appears to be clearly supported by the general context: the addition of the word "with instructions" merely further clarifies the meaning of the phrase***>;

means for sending an http message ~~to send a short message~~ to a short message sending server (18) from said SS7-IP gateway (16), said http message being a message with instructions to send the short message;

means for sending ~~a~~the short message addressed to the ~~subscriber~~visiting subscriber (201) to a Short Message Service Centre (~~SMSC~~)-(10) of the visited network (100) from said short message sending server (18), upon receipt of said instructions by said short message sending server.

45.- A system according to any of the previous claims, characterised in that it comprises means for selecting text for the short message-text based on the identity of the home mobile telephony network ~~(HPLMN)~~ as determined by-

6.- A system according to claim 5, characterised in that it comprises means for selecting the short message text based on the IMSI International Mobile Subscriber Identity of the visiting subscriber.

75.- A system according to claim 43, characterised in that the short message sending server (18) includes a database with short message texts and means for selecting a short message text based on an indicator code included in the http message received from the SS7-IP gateway (16).

86.- A system according to claim 43, characterised in that the http message includes at least one indicator code of a short message text and the mobile telephone number ~~(MSISDN)~~ of the subscribervisiting subscriber (201) to whom the short message must be sent.

97.- A system according to any of the previous claims, characterised in that it comprises means for sending an initial control set-up message to a first node (11), comprising at least the following data: the telephone number dialled by the subscribervisiting subscriber; the mobile telephone number ~~(MSISDN)~~ of the subscribervisiting subscriber; and the IMSI International Mobile Subscriber Identity of the subscribervisiting subscriber.

108.- A system according to claim 97, characterised in that the means for sending an initial control set-up message to the first node (11) are comprised in the Mobile Switching Centres (5, 6) of the visited mobile telephony network ~~(VPLMN)~~, such that when a subscribervisiting subscriber in a cell (2) corresponding to an Mobile Switching Centre (5) dials a telephone number, said Mobile Switching Centre sends the initial control set-up message to the first node (11).

149.- A system according to any of the previous claims, characterised in that it comprises control means for preventing a second short message with a dialling error notification from being sent to a subscribervisiting subscriber if the time elapsed since a first short message with a dialling error notification was sent to said subscribervisiting subscriber is less than a predetermined minimum time.

102.- A system according to any of the previous claims, characterised in that the error criteria include one or several criteria selected from the group comprising the following criteria:

- the number dialled begins with "+" followed by a sign different from a figure C,

1 ≤ C ≤ 9;

- the number dialled begins with "00" followed by a sign different from a figure C, 1 ≤ C ≤ 9;

5 - the number dialled is a 9-figure number beginning with a figure which is not 6, 7, 8 or 9;

- the number dialled begins with "+" or "00" followed by a country code followed by an escape code not applicable for international dialling to said country; and

- the number dialled is a number with fewer than 9 figures which is not a short code.

10 ~~113.~~ A dialling error notification method for visiting subscribers in a visited mobile telephony network (~~VPLMN~~)-(100), a visiting subscriber being a subscriber from a home mobile telephony network (~~HPLMN~~)-(200) different from the visited mobile telephony network (100), characterised in that it comprises the steps of:

15 (a) analysing in a first node (11) of the visited mobile telephony network (100) a number dialled by the subscriber/visiting subscriber and determining whether said number dialled complies with at least one predetermined error criterion;

 (b) sending at least one short message (SM) to the subscriber/visiting subscriber if said dialled number complies with at least one predetermined error criterion, said short message comprising at least one dialling error notification;

20 (c) determining the identity of the home mobile telephony network based on the International Mobile Subscriber Identity of the visiting subscriber <***this feature was defined in originally filed claim 16***>.

 124.- A method according to claim 113, characterised in that the first node is a Service Control Point (~~SCP~~)-(11) of the visited mobile telephony network (100).

25 135.- A method according to any of claims 113 and 124, characterised in that

~~(de) the identity of the home mobile telephony network (HPLMN) of the subscriber is determined and based on the identity~~ home mobile telephony network (~~HPLMN~~) of the subscriber/visiting subscriber as determined by the International Mobile Subscriber Identity of the visiting subscriber, it is determined whether the subscriber/visiting subscriber has the right to a dialling error notification service.

30 ~~146.- A method according to claim 15, characterised in that the identity of the home mobile telephony network is determined based on the IMSI of the subscriber.~~

~~147.- A method according to any of claims 15 and 16~~ 13, characterised in that steps (c) and (d) ~~are~~ is carried out before step (b).

35 158.- A method according to claim 147, characterised in that steps (c) and (d) ~~is~~

are carried out before step (a).

169. A method according to any of claims 113 to 158, characterised in that step (b) comprises:

5 - sending a message (M1) ~~to send a short message to~~ an SS7-IP gateway (16) from a Service Control Point ~~(SCP)~~ (11), said message (M1) being a message with instructions to send the short message;

- sending an http message ~~to send a short message to~~ a short message sending server (18) from said SS7-IP gateway, said http message being a message with instructions to send the short message;

10 - sending ~~at~~ the short message addressed to the visiting subscriber (201) to a Short Message Service Centre ~~(SMSC)~~ (10) of the visited network (100) from said server (18), upon receipt of said instructions by said short message sending server.

2017.- A method according to any of claims 113 to 169, characterised in that text for the short message-text is selected based on the identity of the home mobile telephony network as determined by (HPLMN).

21. ~~A method according to claim 20, characterised in that the short message text is selected based on the IMSI~~ International Mobile Subscriber Identity of the visiting subscriber.

1822.- A method according to claim ~~49~~17 when depending from claim 16, characterised in that the text is selected from a plurality of texts comprised in a database of the short message sending server (18) based on an indicator code included in the http message received from the SS7-IP gateway (16).

2319.- A method according to claim ~~49~~16, characterised in that the http message includes at least one indicator code indicating a short message text and the mobile telephone number ~~(MSISDN)~~ of the ~~subscriber~~ visiting subscriber (201) to whom the short message must be sent.

204.- A method according to any of claims 113 to 2319, characterised in that it comprises a first step comprising sending an initial control set-up message to the first node (11), comprising at least the following data: the telephone number dialled by the ~~subscriber~~ visiting subscriber; the mobile telephone number ~~(MSISDN)~~ of the ~~subscriber~~ visiting subscriber; and the ~~IMSI~~ International Mobile Subscriber Identity of the ~~subscriber~~ visiting subscriber.

215.- A method according to claim 204, characterised in that the initial control set-up message is sent from an Mobile Switching Centre (5) of the visited mobile telephony network (100) corresponding to the cell (2) in which the ~~subscriber~~ visiting

subscriber is located.

226.- A method according to any of claims 113 to 215, characterised in that before sending a short message with a dialling error notification to the subscriber visiting subscriber, it is checked that a predetermined minimum time has elapsed since a previous short message with a dialling error notification was sent to the same subscriber visiting subscriber, and if said predetermined minimum time has not elapsed, the short message with a dialling error notification is not sent.

237.- A method according to any of claims 113 to 226, characterised in that the error criteria include one or several criteria selected from the group comprising the following criteria:

- the number dialled begins with "+" followed by a sign different from a figure C, $1 \leq C \leq 9$;

- the number dialled begins with "00" followed by a sign different from a figure C, $1 \leq C \leq 9$;

- the number dialled is a 9-figure number beginning with a figure which is not 6, 7, 8 or 9;

- the number dialled begins with "+" or "00" followed by a country code followed by an escape code not applicable for international dialling to said country; and

- the number dialled is a number with fewer than 9 figures which is not a short code.

248.- A method according to any of claims 113 to 237, characterised in that it is only carried out for visiting subscribers who are not provided with CAMEL service O-CSI flag.

CLAIMS

1. A dialling error notification system for visiting subscribers in a visited mobile telephony network (100), a visiting subscriber being a subscriber from a home mobile telephony network (200) different from the visited mobile telephony network (100),
5 characterised in that it comprises:

a first node (11) of the visited mobile telephony network (100) comprising means for analysing a number dialled by a visiting subscriber (201) and determining whether said dialled number complies with at least one predetermined error criterion; and

10 means for sending a short message with a dialling error notification to the visiting subscriber if said dialled number complies with at least one predetermined error criterion;

means for determining the identity of the home mobile telephony network (200) based on the International Mobile Subscriber Identity of the visiting subscriber.

15 2.- A system according to claim 1, characterised in that said first node is a Service Control Point (11) of the visited mobile telephony network (100).

3.- A system according to any of the previous claims, characterised in that it comprises:

20 means for sending a message (M1) to an SS7-IP gateway (16) from the first node (11) of the visited mobile telephony network (100), said message (M1) being a message with instructions to send the short message;

means for sending an http message to a short message sending server (18) from said SS7-IP gateway (16), said http message being a message with instructions to send the short message;

25 means for sending the short message addressed to the visiting subscriber (201) to a Short Message Service Centre (10) of the visited network (100) from said short message sending server (18), upon receipt of said instructions by said short message sending server.

30 4.- A system according to any of the previous claims, characterised in that it comprises means for selecting text for the short message based on the identity of the home mobile telephony network as determined by the International Mobile Subscriber Identity of the visiting subscriber.

5.- A system according to claim 3, characterised in that the short message sending server (18) includes a database with short message texts and means for
35 selecting a short message text based on an indicator code included in the http

message received from the SS7-IP gateway (16).

6.- A system according to claim 3, characterised in that the http message includes at least one indicator code of a short message text and the mobile telephone number of the visiting subscriber (201) to whom the short message must be sent.

5 7.- A system according to any of the previous claims, characterised in that it comprises means for sending an initial control set-up message to a first node (11), comprising at least the following data: the telephone number dialled by the visiting subscriber; the mobile telephone number of the visiting subscriber; and the International Mobile Subscriber Identity of the visiting subscriber.

10 8.- A system according to claim 7, characterised in that the means for sending an initial control set-up message to the first node (11) are comprised in the Mobile Switching Centres (5, 6) of the visited mobile telephony network, such that when a visiting subscriber in a cell (2) corresponding to a Mobile Switching Centre (5) dials a telephone number, said Mobile Switching Centre sends the initial control set-up
15 message to the first node (11).

9.- A system according to any of the previous claims, characterised in that it comprises control means for preventing a second short message with a dialling error notification from being sent to a visiting subscriber if the time elapsed since a first short message with a dialling error notification was sent to said visiting subscriber is less
20 than a predetermined minimum time.

10.- A system according to any of the previous claims, characterised in that the error criteria include one or several criteria selected from the group comprising the following criteria:

- 25 - the number dialled begins with "+" followed by a sign different from a figure C, $1 \leq C \leq 9$;
- the number dialled begins with "00" followed by a sign different from a figure C, $1 \leq C \leq 9$;
- the number dialled is a 9-figure number beginning with a figure which is not 6, 7, 8 or 9;
- 30 - the number dialled begins with "+" or "00" followed by a country code followed by an escape code not applicable for international dialling to said country; and
- the number dialled is a number with fewer than 9 figures which is not a short code.

35 11. A dialling error notification method for visiting subscribers in a visited mobile telephony network (100), a visiting subscriber being a subscriber from a home mobile

telephony network (200) different from the visited mobile telephony network (100), characterised in that it comprises the steps of:

(a) analysing in a first node (11) of the visited mobile telephony network (100) a number dialled by the visiting subscriber and determining whether said number dialled
5 complies with at least one predetermined error criterion;

(b) sending at least one short message (SM) to the visiting subscriber if said dialled number complies with at least one predetermined error criterion, said short message comprising at least one dialling error notification;

(c) determining the identity of the home mobile telephony network based on the
10 International Mobile Subscriber Identity of the visiting subscriber.

12.- A method according to claim 11, characterised in that the first node is a Service Control Point (11) of the visited mobile telephony network (100).

13.- A method according to any of claims 11 and 12, characterised in that

(d) based on the identity home mobile telephony network of the visiting
15 subscriber as determined by the International Mobile Subscriber Identity of the visiting subscriber, it is determined whether the visiting subscriber has the right to a dialling error notification service.

14.- A method according to claim 13, characterised in that steps (c) and (d) are carried out before step (b).

20 15.- A method according to claim 14, characterised in that steps (c) and (d) are carried out before step (a).

16. A method according to any of claims 11 to 15, characterised in that step (b) comprises:

- sending a message (M1) to an SS7-IP gateway (16) from a Service Control
25 Point (11), said message (M1) being a message with instructions to send the short message;

- sending an http message to a short message sending server (18) from said SS7-IP gateway, said http message being a message with instructions to send the short message;

30 - sending the short message addressed to the visiting subscriber (201) to a Short Message Service Centre (10) of the visited network (100) from said server (18), upon receipt of said instructions by said short message sending server.

17.- A method according to any of claims 11 to 16, characterised in that text for the short message is selected based on the identity of the home mobile telephony
35 network as determined by the International Mobile Subscriber Identity of the visiting

subscriber.

18.- A method according to claim 17 when depending from claim 16, characterised in that the text is selected from a plurality of texts comprised in a database of the short message sending server (18) based on an indicator code included in the http message received from the SS7-IP gateway (16).

19.- A method according to claim 16, characterised in that the http message includes at least one indicator code indicating a short message text and the mobile telephone number of the visiting subscriber (201) to whom the short message must be sent.

20.- A method according to any of claims 11 to 19, characterised in that it comprises a first step comprising sending an initial control set-up message to the first node (11), comprising at least the following data: the telephone number dialled by the visiting subscriber; the mobile telephone number of the visiting subscriber; and the International Mobile Subscriber Identity of the visiting subscriber.

21.- A method according to claim 20, characterised in that the initial control set-up message is sent from an Mobile Switching Centre (5) of the visited mobile telephony network (100) corresponding to the cell (2) in which the visiting subscriber is located.

22.- A method according to any of claims 11 to 21, characterised in that before sending a short message with a dialling error notification to the visiting subscriber, it is checked that a predetermined minimum time has elapsed since a previous short message with a dialling error notification was sent to the same visiting subscriber, and if said predetermined minimum time has not elapsed, the short message with a dialling error notification is not sent.

23.- A method according to any of claims 11 to 22, characterised in that the error criteria include one or several criteria selected from the group comprising the following criteria:

- the number dialled begins with "+" followed by a sign different from a figure C, $1 \leq C \leq 9$;
- the number dialled begins with "00" followed by a sign different from a figure C, $1 \leq C \leq 9$;
- the number dialled is a 9-figure number beginning with a figure which is not 6, 7, 8 or 9;
- the number dialled begins with "+" or "00" followed by a country code followed by an escape code not applicable for international dialling to said country; and
- the number dialled is a number with fewer than 9 figures which is not a short

code.

24.- A method according to any of claims 11 to 23, characterised in that it is only carried out for visiting subscribers who are not provided with CAMEL service O-CSI flag.